

5.16.34 SIEVE ANALYSIS OF EXTRACTED AGGREGATE (Kansas Test Method KT-34)

a. SCOPE

This method of test covers the procedure for determination of the particle size distribution of aggregate extracted from asphalt mixtures. KT-34 reflects testing procedures found in AASHTO T 30.

b. REFERENCED DOCUMENTS

- b.1.** KT-2; Sieve Analysis of Aggregates
- b.2.** KT-57; Determination of Asphalt Content and Gradation of Hot Mix Asphalt Concrete by the Ignition Method
- b.3.** AASHTO M 92; Wire-Cloth Sieves for Testing Purposes
- b.4.** AASHTO M 231; Balances Used in the Testing of Materials
- b.5.** AASHTO T 30; Mechanical Analysis of Extracted Aggregate

c. APPARATUS

- c.1.** The balance shall conform to the requirements of AASHTO M 231 for the class of general purpose balance required, and be readable to 0.1% for the principal sample mass of the sample being tested.
- c.2.** Appropriate sieves meeting AASHTO M 92.
- c.3.** Oven capable of maintaining a uniform temperature of $110 \pm 5^{\circ}\text{C}$ ($230 \pm 9^{\circ}\text{F}$).
- c.4.** Drying pans.

d. SAMPLE

The sample shall consist of the entire sample of aggregate from the test for asphalt binder content of paving mixtures by ignition method (KT-57) from which the asphalt material has been extracted.

e. TEST PROCEDURE

- e.1.** The sample shall be dried to constant mass at a temperature of $110 \pm 5^{\circ}\text{C}$ ($230 \pm 9^{\circ}\text{F}$) and weighed to the nearest 0.1 percent. The total mass of the aggregate shall be the sum of the extracted aggregate and the mineral matter (ash) from the extracted asphalt binder.
- e.2.** The test sample shall be placed in a container and covered with water containing a sufficient amount of wetting agent to assure a thorough separation of the material finer than the $75\ \mu\text{m}$ (No. 200) sieve. The use of a large spoon to stir and agitate the aggregate in the wash water has been found satisfactory.

e.3. The agitation shall be sufficiently vigorous to result in the complete separation from the coarse particles of all particles finer than the 75µm (No. 200) sieve and bring them into suspension in order that they may be removed by decantation of the wash water. Care shall be taken to avoid, as much as possible, the decantation of the coarse particles of the sample. The operation shall be repeated until the wash water is clear.

e.4. All materials retained on the sieves shall be returned to the container. The washed aggregate in the container shall be dried to constant mass at a temperature of $110 \pm 5^{\circ}\text{C}$ ($230 \pm 9^{\circ}\text{F}$) and weighed to the nearest 0.1 percent.

e.5. The aggregate shall then be sieved according to procedures found in KT-2 **f.1.** through **f.3.** The cumulative mass of material retained on all of the sieves including the 75µm (No. 200) sieve, plus the mass of dry material passing the 75µm (No. 200) sieve by dry sieving must check the dried mass after washing within 0.2 percent of the total mass. The cumulative mass of the material retained on the various sieves shall be recorded. The mass of the material passing the 75µm (No. 200) sieve, determined by subtracting the cumulative mass of the material retained on all sieves from the total mass of the sample, shall also be recorded.

f. CALCULATIONS

The mass of the material retained on the various sieves and the total passing the 75µm (No. 200) sieve shall be converted to percentages by dividing each by the total mass of the aggregate and multiplying by 100.

g. REPORT

The report shall include the results of the sieve analysis reported as the cumulative percentage retained on each sieve. The percent passing the 75µm (No. 200) sieve shall also be reported. Percentages shall be reported to the nearest whole percent except for the percentage passing the 75µm (No. 200) sieve which shall be reported to the nearest 0.1 percent.

h. PRECISION

h.1. Precision -- The estimates of precision for this test method are listed in Table 5.16.34-01. The estimates are based on the results from the AASHTO Materials Reference Laboratory Proficiency Sample Program, with testing conducted by AASHTO T 30. The data are based on the analyses of the test results from 47 to 90 laboratories that tested 17 pairs of proficiency test samples (Samples No. 1 through 34). The values in the table are given for different ranges of total percentage of aggregate passing a sieve.

Table 5.16.34-01 Precision

	Total Percentage of of Material Passing A Sieve	Standard Deviation (1S) Percent ^A	Acceptable Range of Two Result--(D2S) ^A Percent	
Extracted Aggregate: ^B				
Single operator	<100	≥95	0.49	1.4
Precision	<95	≥40	1.06	3.0
	<40	≥25	0.65	1.8
	<25	≥10	0.46	1.3
	<10	≥5	0.29	0.8
	<5	≥2	0.21	0.6
	<2	≥0	0.17	0.5
Multilaboratory				
Precision	<100	≥95	0.57	1.6
	<95	≥40	1.24	3.5
	<40	≥25	0.84	2.4
	<25	≥10	0.81	2.3
	<10	≥5	0.56	1.6
	<5	≥2	0.43	1.2
	<2	≥0	0.32	0.9

Note A: These numbers represent, respectively, the (1S) and (D2S) limits described in Practice 670.

Note B: The precision estimates are based on aggregates with nominal maximum sizes of 19.0 mm (3/4 in) to 9.5 mm (3/8 in).